



# COMMONWEALTH of VIRGINIA

Department of Health

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July 31, 1995

## MEMORANDUM

To: District Health Directors

From: Grayson B. Miller, Jr., M.D., Director.  
Office of Epidemiology

Subject: Follow-up of Sporadic Cases of *Escherichia coli* O157:H7 Infection and Sporadic Cases of Hemolytic Uremic Syndrome (HUS)

The number of cases of *E coli* O157:H7 gastroenteritis and HUS appears to be increasing in Virginia. HUS is characterized by microangiopathic hemolytic anemia, thrombocytopenia and renal failure; it typically occurs in young children. *E. coli* O157:H7 is a frequent cause of HUS. Although neither condition is officially reportable in Virginia except as part of an outbreak, the Office of Epidemiology routinely receives questions as to what type of investigation should be done for sporadic cases. We believe that some investigation is warranted to determine whether the sporadic case may be part of an outbreak. To assist your staff in doing this we have developed a worksheet, fact sheet and instructions for handling laboratory specimens, that you may wish to use. Investigation of a sporadic case should begin once the O157 antigen is identified since it may take weeks to complete typing of the H7 antigen. For cases of HUS, investigation should begin as soon as the diagnosis of HUS is made since it is often the sentinel event in an outbreak of *E. coli* O157:H7.

Key points in the worksheet include determining if the case is in daycare, asking if other family members are ill, evaluating the water source, and obtaining a seven day food history. If the timing of illness is compatible with ground beef consumption at a restaurant, the restaurant should be inspected. Even though it is unlikely that you would be able to "prove" that a single case is linked to a particular restaurant, the restaurant's cooking procedures should be evaluated and the environmental health specialists should make sure the restaurant knows that ground beef should be cooked to at least 155°F.

I hope this information is helpful. If you or your staff have any questions about *E coli* O157:H7 or would like any assistance in conducting an investigation, please call Dr. Elizabeth Barrett at (804)786-6029.

Enclosures: *E. coli* O157:H7 Case Worksheet  
*E. coli* O157:H7 Fact Sheet  
Summary of the CDC Guidelines for the Collection and Handling of Specimens for *E. coli* O157:H7 Isolation

c: Robert W. Hicks

Interviewer's Name & Phone # \_\_\_\_\_  
Date of Interview \_\_\_\_\_

***E. Coli* O157 and Shiga-toxin Related Disease Questionnaire** (revised 6/5/01)

Name (last,first,MI)_____	
Street_____	
City_____	State_____ Zip_____
Telephone: home (_____)_____ work (_____)_____	
Age _____	DOB _____ Sex: Male Female Race:_____
Name/relationship of person responding to questionnaire_____	

1. Onset of illness Date \_\_\_\_\_ Time \_\_\_\_\_
2. Symptoms:

Diarrhea	Yes	No	Date_____	Max. # of stools/24 hrs. _____
Bloody diarrhea	Yes	No	Date_____	
Abdominal cramps	Yes	No	Date_____	
Nausea	Yes	No	Date_____	
Vomiting	Yes	No	Date_____	
Headache	Yes	No	Date_____	
Fever	Yes	No	Date_____	Highest temp. _____
3. Did the patient seek medical care for any of these symptoms? Yes No  
M.D. \_\_\_\_\_ phone \_\_\_\_\_  
Treatment \_\_\_\_\_
4. Was a stool culture or rectal swab done? Yes No  
Test Date and Results \_\_\_\_\_
5. Were you hospitalized overnight? Yes No  
Hospital \_\_\_\_\_ Dates \_\_\_\_\_
6. Did you develop HUS (hemolytic uremic syndrome)? Yes No (HUS is anemia, low platelet count, kidney impairment)
7. Did you develop TPP (thrombocytic thrombocytopenic purpura)? Yes No  
(TPP is anemia, low platelet count, kidney impairment, central nervous system involvement, fever)
8. Was dialysis done? Yes No
9. Date of Recovery \_\_\_\_\_ Died? Yes No
10. Are there any household members, friends or other associates who have recently had diarrhea or other symptoms similar to yours? Yes No  
If yes, names/relationship/address/phone:  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

12. Is patient in daycare or exposed to children in daycare?      Yes      No  
If yes, name/address/phone of daycare\_\_\_\_\_

Are there any other kids/adults at daycare with diarrhea?                      Yes                      No

13. Did the patient have any exposure to children in diapers? (i.e. changing diapers, playing with young children, taking care of young children)      Yes      No

If yes, describe activity\_\_\_\_\_

14. (If patient is an adult) What is occupation? \_\_\_\_\_

15. For the week before onset of illness (dates \_\_\_\_\_ - \_\_\_\_\_) complete the following information:

a. Describe drinking water source: At home \_\_\_\_\_

At school/daycare \_\_\_\_\_

## At work

b. Visit a farm or petting zoo?    Yes    No    when/where: \_\_\_\_\_

c. Have direct contact with farm or zoo animals? Yes No Describe: \_\_\_\_\_

d. Have contact with animal manure as might occur during farming, gardening, or caring for animals? Yes No Describe:

e. Contact with reptiles (snakes, lizards, turtles)?    Yes    No    Describe:\_\_\_\_\_

f. Contact with household pets? Yes No Describe: \_\_\_\_\_

g. Contact with any animals that were sick or had diarrhea?    Yes    No    \_\_\_\_\_

h. Attend any large gatherings (parties, festivals, fairs, etc.)? Yes No when/where/foods:\_\_\_\_\_

i. Any swimming or wading?    Yes    No    If yes, what kind of swimming area was it? (when/where)

Wading or kiddie pool      Yes      No      \_\_\_\_\_

Swimming pool	Yes	No	_____
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Hot tub, jacuzzi or spa	Yes	No	
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Pond, lake, river or stream    Yes    No

Submerge head under water? Yes      No

Swallow any water?	Yes	No

j. Travel within Virginia?    Yes    No    when/ where: \_\_\_\_\_

k. Travel out of state?      Yes    No    when/ where:

- l. List names and locations of all restaurants, take out places, cafeteria, etc. where food was eaten or "taken out" and eaten elsewhere: (name, location,date,foods):


- m. Where did you purchase groceries that were eaten during the 7 days before illness began? (Including specialty stores, produce or fruit stands, farmer's markets, etc.)

Name _____	Location _____
Name _____	Location _____
Name _____	Location _____
Name _____	Location _____

16. Please try to remember what you may have eaten in the 7-day period before you started feeling sick. Let's start with the day before you got sick and work backwards. If a meal was eaten out, specify where. *(It is very difficult for people to remember what they did and ate but try to be as complete as possible. Using a calendar helps. Other aids for recalling foods purchased or eaten include: personal datebooks, grocery receipts, charge card receipts, and checkbook notations. Remembering special events or dates helps trigger other memories. This is difficult, but it is the only way to figure out why people got sick.)*

**Day 1** \_\_\_\_\_, \_\_\_\_/\_\_\_\_/\_\_\_\_

<i>Breakfast</i>	<i>Lunch</i>	<i>Dinner</i>	<i>Other/snacks</i>
home or out _____	home or out _____	home or out _____	
_____	_____	_____	_____
_____	_____	_____	_____
_____	_____	_____	_____
_____	_____	_____	_____

**Day 2** \_\_\_\_\_, \_\_\_\_/\_\_\_\_/\_\_\_\_

<i>Breakfast</i>	<i>Lunch</i>	<i>Dinner</i>	<i>Other/snacks</i>
home or out _____	home or out _____	home or out _____	
_____	_____	_____	_____
_____	_____	_____	_____
_____	_____	_____	_____
_____	_____	_____	_____

**Day 3** \_\_\_\_\_, \_\_\_\_/\_\_\_\_/\_\_\_\_

<i>Breakfast</i>	<i>Lunch</i>	<i>Dinner</i>	<i>Other/snacks</i>
home or out _____	home or out _____	home or out _____	
_____	_____	_____	_____
_____	_____	_____	_____
_____	_____	_____	_____
_____	_____	_____	_____

**Day 4** \_\_\_\_\_, \_\_\_\_/\_\_\_\_/\_\_\_\_

<i>Breakfast</i>	<i>Lunch</i>	<i>Dinner</i>	<i>Other/snacks</i>
home or out _____	home or out _____	home or out _____	
_____	_____	_____	_____
_____	_____	_____	_____
_____	_____	_____	_____
_____	_____	_____	_____

Day 5 \_\_\_\_\_, \_\_\_\_/\_\_\_\_/\_\_\_\_

*Breakfast*

home or out \_\_\_\_\_

*Lunch*

home or out \_\_\_\_\_

*Dinner*

home or out \_\_\_\_\_

*Other/snacks*

_____	_____	_____	_____
_____	_____	_____	_____
_____	_____	_____	_____

Day 6 \_\_\_\_\_, \_\_\_\_/\_\_\_\_/\_\_\_\_

*Breakfast*

home or out \_\_\_\_\_

*Lunch*

home or out \_\_\_\_\_

*Dinner*

home or out \_\_\_\_\_

*Other/snacks*

_____	_____	_____	_____
_____	_____	_____	_____
_____	_____	_____	_____

Day 7 \_\_\_\_\_, \_\_\_\_/\_\_\_\_/\_\_\_\_

*Breakfast*

home or out \_\_\_\_\_

*Lunch*

home or out \_\_\_\_\_

*Dinner*

home or out \_\_\_\_\_

*Other/snacks*

_____	_____	_____	_____
_____	_____	_____	_____
_____	_____	_____	_____

**17. Detailed Food History.** Now I'd like to ask you about specific food items that you may have eaten. During the 7 days before you got sick, did you eat the following items?

**A. Dairy Products**

*Comments (variety/brand, how prepared, where bought/eaten, etc.)*

Milk	yes	no	dk/ns	_____
Buttermilk	yes	no	dk/ns	_____
Sour cream	yes	no	dk/ns	_____
Cream cheese	yes	no	dk/ns	_____
Cottage cheese	yes	no	dk/ns	_____
Icecream	yes	no	dk/ns	_____
Frozen dessert novelties	yes	no	dk/ns	_____
Yogurt	yes	no	dk/ns	_____
Soft cheeses	yes	no	dk/ns	_____
brie	yes	no	dk/ns	_____
caso fresco	yes	no	dk/ns	_____
cream cheese	yes	no	dk/ns	_____
feta	yes	no	dk/ns	_____
mozzarella	yes	no	dk/ns	_____
ricotta	yes	no	dk/ns	_____
other (soft)	yes	no	dk/ns	_____
Other cheeses	yes	no	dk/ns	specify _____
Any unpasteurized milk, yogurt, cheese or other dairy products? yes    no    dk/ns				
if yes, specify _____				

**B. Hamburger and Ground Beef** (Ask for **all** patients for the week before illness onset)

a. Did the patient prepare or handle raw ground beef?    Yes    No    When: \_\_\_\_\_

b. Eat a hamburger prepared at home? Yes No When: \_\_\_\_\_  
 If yes: was it rare (red in middle) medium (pink in middle) well done (no pink)  
 Was it cooked on an outside grill? Yes No

c. Eat other ground beef dish at home? Yes No Describe: \_\_\_\_\_

For **all** hamburger/ground beef eaten at home or that the patient prepared at home, answer the following:

Was it: Fresh (never frozen) ground beef Yes No where purchased \_\_\_\_\_

Previously frozen ground beef Yes No where purchased \_\_\_\_\_

Pre-made uncooked patties Yes No where purchased \_\_\_\_\_

Fresh or Frozen

Pre-made, pre-cooked patties Yes No where purchased \_\_\_\_\_

d. Eat a hamburger at a restaurant? Yes No when/where: \_\_\_\_\_

e. Eat a ground beef dish at a restaurant? Yes No what/when/where: \_\_\_\_\_

### C. Fish, Poultry, and Meats

Fish yes no dk/ns \_\_\_\_\_

Shellfish yes no dk/ns specify \_\_\_\_\_

(such as shrimp, lobster, clams, etc.)

Chicken yes no dk/ns \_\_\_\_\_

Turkey yes no dk/ns \_\_\_\_\_

Steak yes no dk/ns \_\_\_\_\_

Roast beef yes no dk/ns \_\_\_\_\_

Other beef yes no dk/ns \_\_\_\_\_

Pork yes no dk/ns \_\_\_\_\_

Veal yes no dk/ns \_\_\_\_\_

Lamb yes no dk/ns \_\_\_\_\_

Venison yes no dk/ns \_\_\_\_\_

Sausage yes no dk/ns \_\_\_\_\_

Hot dog yes no dk/ns \_\_\_\_\_

Beef jerky yes no dk/ns \_\_\_\_\_

Salami yes no dk/ns \_\_\_\_\_

Deli items/sandwich meats yes no dk/ns \_\_\_\_\_

if yes, describe: \_\_\_\_\_

**INDIRECT EXPOSURE TO RAW MEATS** (Ask for **all** patients for the week before illness onset)

**Did you handle any raw meat at home or anywhere else in the 7 days before your illness?** yes no dk/ns

If yes, what kind of meat(s) was it? \_\_\_\_\_

### D. Fresh/Uncooked Vegetables and Salads

Prepackaged salad mix yes no dk/ns \_\_\_\_\_

Specify what items are in the salad: \_\_\_\_\_

Lettuce yes no dk/ns \_\_\_\_\_

Iceberg yes no dk/ns \_\_\_\_\_

Green leaf yes no dk/ns \_\_\_\_\_

Red leaf yes no dk/ns \_\_\_\_\_

Romaine yes no dk/ns \_\_\_\_\_

Mesclun yes no dk/ns \_\_\_\_\_

(also called mixed greens or spring mix-this is often in bins and you use tongs to put in a bag)

Other yes no dk/ns specify: \_\_\_\_\_

Alfalfa sprouts yes no dk/ns \_\_\_\_\_

Other sprouts yes no dk/ns specify: \_\_\_\_\_

Spinach yes no dk/ns \_\_\_\_\_

Cabbage yes no dk/ns \_\_\_\_\_

Tomatoes yes no dk/ns regular/large or cherry tomatoes \_\_\_\_\_

Carrots yes no dk/ns regular/large or baby carrots \_\_\_\_\_

Broccoli yes no dk/ns \_\_\_\_\_

Cucumbers yes no dk/ns \_\_\_\_\_

Celery	yes	no	dk/ns	
Squash	yes	no	dk/ns	
Asparagus	yes	no	dk/ns	
Mushrooms	yes	no	dk/ns	
Peppers	yes	no	dk/ns	
Pea pods/raw peas	yes	no	dk/ns	
Onions	yes	no	dk/ns	
specify: green (spring) onions ,etc.				
Radishes	yes	no	dk/ns	
Fresh herbs	yes	no	dk/ns	
specify: cilantro, basil, parsley, etc.				
Avocado	yes	no	dk/ns	
Tofu	yes	no	dk/ns	
Dips (for vegetables or chips)	yes	no	dk/ns	
Green (tossed) salad	yes	no	dk/ns	
Caesar salad	yes	no	dk/ns	
Tabouleh salad	yes	no	dk/ns	
Cole slaw	yes	no	dk/ns	
Potato salad	yes	no	dk/ns	
Pasta salad	yes	no	dk/ns	
Fruit salad	yes	no	dk/ns	
Taco salad	yes	no	dk/ns	
Other salad - specify _____				
Eat anything from a salad bar?	yes	no	dk/ns	specify: _____

### E. Fresh Fruits

Watermelon	yes	no	dk/ns	
Cantaloupe	yes	no	dk/ns	
Other melon	yes	no	dk/ns	specify: _____
Oranges	yes	no	dk/ns	
Other citrus	yes	no	dk/ns	
Pears	yes	no	dk/ns	
Apples	yes	no	dk/ns	
Other tree fruit	yes	no	dk/ns	specify: _____
(Peaches, nectarines, plums, apricots, cherries, etc.)				
Bananas	yes	no	dk/ns	
Grapes	yes	no	dk/ns	red or green? _____
Strawberries	yes	no	dk/ns	
Blueberries	yes	no	dk/ns	
Raspberries	yes	no	dk/ns	
Other berries	yes	no	dk/ns	specify: _____
Kiwi	yes	no	dk/ns	
Mango	yes	no	dk/ns	
Pineapple	yes	no	dk/ns	
Papaya	yes	no	dk/ns	
Other fruit	yes	no	dk/ns	specify: _____

### F. Juices/Drinks

Apple juice/cider	yes	no	dk/ns	was it made from concentrate? _____
Orange juice	yes	no	dk/ns	was it made from concentrate? _____
Smoothie	yes	no	dk/ns	specify _____ any from concentrate? _____
Other juices	yes	no	dk/ns	specify _____ any from concentrate? _____
Any of the juices unpasteurized?	yes	no	dk/ns	_____
Bottled water	yes	no	dk/ns	
Herbal teas or drinks	yes	no	dk/ns	

**E. Miscellaneous**

Herbal medicines	yes	no	dk/ns	specify	_____
Nutritional supplements	yes	no	dk/ns	specify	_____
Vitamins	yes	no	dk/ns	specify	_____
Other	yes	no	dk/ns	specify	_____



## **Summary of the CDC Guidelines for the Collection and Handling of Specimens for *E. coli* O157:117 Isolation**

The Virginia Division of Consolidated Laboratory Services (DCLS) accepts stool specimens for *E. coli* O157:117 isolation. The following is a summary of the CDC guidelines for collecting and handling specimens. For further information, you may call DCLS (Microbial Reference Unit) at (804)786-5147.

1. Collect the stool specimen as soon after onset of diarrhea as possible. Many patients excrete the organism for less than one week although some excrete it for more than three weeks.
2. After antibiotic treatment has stopped, wait at least 48 hours before collecting the specimen.
3. The specimen should be collected in Cary-Blair transport medium (this is the routine enteric bacteriologic container).
4. In suspected outbreak situations where several specimens are being shipped together, refrigerate the specimens upon collection and ship cold to DCLS. If it will take more than 3 days for the specimens to get to the lab, freeze the specimens immediately and ship on dry ice. Specimens should not be refrigerated for days and then frozen, or placed in transport medium and left at room temperature.
5. To optimize the chances of isolating *E. coli* O157:117, follow the procedure in step #4 for individual cases as well as outbreaks. However, the lab will accept individual specimens for testing if they are not refrigerated or frozen. The specimens must be in Cary-Blair medium and should be transported as quickly as possible. Remember, if specimens are in transit more than three days, the chances of isolating the organism drops significantly.
6. Use the mailing sleeve for individually shipped specimens that are not cold or frozen. Ship cold or frozen specimens to:

Department of General Services  
Division of Consolidated Laboratory Services  
Bureau of Microbiological Science  
Attn: Enteric Laboratory  
1 North 14th Street  
Richmond, VA 23219

7. For outbreak situations, please call the lab at (804)786-5147 to let them know how many specimens are being sent so they can get prepared. This will help expedite the process.

## ***Escherichia coli* O157:H7 (*E.coli* O157:H7)**

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### **What is *E. coli* O157:H7?**

*E.coli* O157:H7 is a bacteria that can cause bloody diarrhea. The term "O157:H7" indicates a particular type of *E. coli* bacteria. Not all strains of *E. coli* cause illness.

### **Who can get *E. coli* O157:H7 infection?**

Anyone, but it appears to be more common in children than adults.

### **Where are *E.coli* O157:H7 bacteria found?**

*E. coli* O157:H7 bacteria can be found in the intestinal tracts of infected humans and cows.

### **How are the bacteria spread?**

The most common cause of *E. coli* O157:H7 infection is eating undercooked ground beef. Raw milk can also contain the bacteria. The bacteria are spread by eating food or water that is contaminated with feces of an infected animal or person. An infected food handler can contaminate food by failing to wash hands after going to the bathroom. Some people have become ill after swimming in lake water contaminated with feces of infected persons or animals.

### **What are the symptoms of *E. coli* O157:H7 infection?**

The major symptoms are stomach cramps and diarrhea, which can look like bloody water. Other symptoms may include vomiting, fever and chills. Some people do not exhibit any symptoms or they may have mild non-bloody diarrhea.

### **Can *E. coli* O157:H7 infection cause severe problems?**

In a small percentage of cases, the infection can cause the kidneys to stop working, especially in young children.

### **How soon after exposure do symptoms appear?**

The symptoms usually start two to four days after exposure but the incubation period can be as short as 12 hours or as long as 10 days.

### **How long can an infected person spread *E. coli* O157:H7?**

An infected person can spread the bacteria to others for as long as the bacteria remains in the stool, usually one week but up to three weeks or more.

### **Should infected people be excluded from school or work?**

Since the bacteria is passed in the feces, children in daycare, health care workers, or people who handle food should not go to school or work while they have diarrhea. After diarrhea ends, persons may return to work or school but they should carefully wash their hands after using the toilet.

### **What is the treatment for *E. coli* O157:H7?**

Most people get well on their own but it is important that anyone having bloody diarrhea seek medical attention. Antibiotics do not appear to help people get better faster and are usually not indicated. Persons with diarrhea should drink plenty of liquids to prevent dehydration.

### **How can *E. coli* O157:H7 infection be prevented?**

1. Never eat rare or undercooked ground beef. Cook to 155° F or until the meat color is brown or grey.
2. Do not drink unpasteurized milk.
3. Always wash any raw fruit or vegetables before eating.
4. Always carefully wash hands before and after preparing foods.
5. Always refrigerate meat products. Never leave raw meats at room temperature.
6. Make sure children wash their hands carefully, especially after using the toilet or handling animals.
7. Always wash hands with soap and warm water after using the toilet or changing diapers.
8. Persons with diarrhea should not use public swimming facilities.